deployment of the prosthetic heart valve, the user may assess whether the valve is being deployed in the correct position. If an adjustment is necessary, the user may move the distal sheath **30** in a distal direction relative to the support shaft **28** to collapse and resheath the prosthetic heart valve. After repositioning the delivery system, the user may again move the distal sheath **30** proximally relative to the support shaft **28** to deploy the prosthetic heart valve at the correct target site.

When the user employs a delivery system with the tip **232** depicted in FIG. **10**, the inner walls of the introducer **500** exert compressive forces on the tip when the tip is positioned within the introducer, thus maintaining the tip in the collapsed condition. As the delivery system is moved distally relative to the introducer **500**, the tip **232** of the delivery system will eventually slide out from the distal end of the introducer. At this point, the porous outer portion **237** of the tip **232** will be exposed to large quantities of blood. As the porous outer portion **237** absorbs blood, it will expand to the expanded condition, as seen in FIG. **10**. In the expanded condition, the maximum diameter $D_1$ of the tip **232** is larger than the outer diameter $D_2$ of the distal sheath **30**, thereby inhibiting the distal end **34** of the distal sheath **30** from contacting the walls of the patient's vasculature. Such action is likely to prevent the distal end **34** from engaging lesions or calcified tissue C on the patient's vasculature.

When the user employs a delivery system with the tip **432** shown in FIG. **11**, the user can actively expand the tip by injecting a fluid, such as saline, into the porous outer portion **437**. In this exemplary method, the user may activate a fluid source coupled to the delivery system when the tip **432** is positioned distally of the introducer **500**. Upon activation, the fluid source will supply a fluid to the porous outer portion **437** of the tip **432** via the conduits **460**. As the outer portion **437** absorbs the fluid from the fluid source, it will expand to its expanded condition.

When the user employs a delivery system with the tip **332** illustrated in FIG. **12**, the user can actively expand the tip by injecting a fluid, such as saline, into the inner cavity **338**. In this exemplary method, the user may activate a fluid source connected to the delivery system when the tip **332** is located distally of the introducer **500**. When the fluid source is activated, it will supply a fluid to the inner cavity **338** of the tip **332** via conduits **360** and, consequently, will expand the tip **332**, as seen in FIG. **12**.

Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

It will be appreciated that the various dependent claims and the features set forth therein can be combined in different ways than presented in the initial claims. It will also be appreciated that the features described in connection with individual embodiments may be shared with others of the described embodiments.

The invention claimed is:

**1**. A delivery system for delivering and deploying a medical implant, comprising:

an elongated support member configured to hold the medical implant;

a sheath having an outer diameter surrounding at least a portion of the elongated support member, the sheath being movable in a longitudinal direction between a proximal position and a distal position relative to the elongated support member; and

a tip attached to the elongated support member so as to overlap an end portion of the elongated support member, the tip being positioned at a distal end of the sheath when the sheath is in the distal position, the tip having an exterior surface, a closed inner cavity containing a fluid substance, a compressed condition, an expanded condition and a variable diameter along a length thereof, the variable diameter including a maximum diameter in the expanded condition, the maximum diameter being larger than the outer diameter of the distal end of the sheath, the tip including at least a first portion formed of a first solid material having a first stiffness and a second portion formed of a second solid material having a second stiffness different from the first stiffness such that a cross-section of the tip in a direction orthogonal to the longitudinal direction and at a spaced distance from the elongated support member passes through both the first portion and the second portion.

**2**. The delivery system of claim **1**, wherein the tip is at least partly made of a compressible material selected from the group consisting of polyether block amide, polyurethane, and silicone rubber.

**3**. The delivery system of claim **1**, wherein the fluid substance is selected from the group consisting of a liquid, a gel, and a gas.

**4**. The delivery system of claim **1**, wherein the maximum diameter of the tip in the expanded condition is about 0.005 inches to about 0.020 inches larger than the outer diameter of the sheath.

**5**. The delivery system of claim **1**, wherein the tip is molded over a portion of the elongated support member.

**6**. The delivery system of claim **1**, further comprising a plurality of longitudinal recesses formed on the exterior surface of the tip along the length of the tip.

**7**. The delivery system of claim **1**, wherein the tip includes an outer member formed from a porous material and an inner member formed from an elastic material.

**8**. The delivery system of claim **7**, wherein the outer member surrounds at least a portion of the inner member.

**9**. The delivery system of claim **7**, wherein the tip further includes an impermeable layer surrounding the outer member.

**10**. The delivery system of claim **1**, wherein the tip is formed by an injection molding process.

**11**. The delivery system of claim **10**, wherein the injection molding process is a multi-step injection molding process.

**12**. The delivery system of claim **10**, wherein the injection molding process includes an overmolding step.

**13**. A delivery system for delivering and deploying a medical implant, comprising:

an elongated support member configured to hold the medical implant;

a sheath having an outer diameter surrounding at least a portion of the elongated support member, the sheath being movable between a proximal position and a distal position relative to the elongated support member; and

a tip attached to the elongated support member and positioned at a distal end of the sheath when the sheath is in the distal position, the tip having an exterior surface, a closed inner cavity, a compressed condition, an expanded condition and a variable diameter along a length thereof, the variable diameter including a maximum diameter in the expanded condition, the maximum diameter being larger than the outer diameter of the distal end of the sheath; and